Construction Contract Audit Fundamentals
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About today’s presenters

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Today’s topics

1. Construction lifecycle
2. Owner’s responsibilities
3. Contracting
4. Audit program and auditing
5. Construction fraud
Learning objectives

1) Identify elements of project risk
2) Understand construction contract fundamentals
3) Understand construction audit program fundamentals
4) Understand the Owner’s development and construction responsibilities
5) Recognize fraud, abusive behaviors and errors
Construction Lifecycle

*Architect/Engineer (A/E)
## Construction Project Management Team

<table>
<thead>
<tr>
<th>Owner</th>
<th>Owner’s Representative</th>
<th>Internal Audit or Other Compliance Representative</th>
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<tbody>
<tr>
<td>Office of General Counsel</td>
<td>Architect</td>
<td>Construction Manager</td>
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<td>Other Groups and Stakeholders. Internal &amp; External</td>
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<td>Owner Responsibilities</td>
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<td>Internal Control</td>
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<td>Contractor Selection</td>
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<td>Owner's Right to Audit</td>
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<td>Progress Reporting</td>
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<td>Change Order Scope</td>
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<td>Project Controls</td>
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<td>Final Walk-through Punch List</td>
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Owner’s responsibilities

During the construction phase

- Controlling capital expenditures
- Monitoring change orders
- Scheduling thousands of activities for hundreds of people
- Maintaining an ethical and safe work environment
Owner’s responsibilities

Common construction risk management myths

> Our architect is analyzing and approving pay applications
> If the architect approved the change order it must be okay
> We have a shared savings provision, our contractor has incentive to minimize project costs
What are the typical environmental factors that raise barriers to construction contract auditing?

> Fear
  - Exposure
  - Embarrassment
  - Weak performance

> Cronyism

> Ignorance

> Territorialism
Actions and indicators of a hostile construction audit environment

Information blockades

> Incomplete reports Bad report example.pdf
> Unreadable reports
> Incomplete data requests
> Paper copy instead of electronic reports

Redirection

> Forgotten meeting invites
> Misinterpreted meeting requests
> Outdated versions of documents
> “You don’t need to attend that meeting”
How do we overcome barriers to success?

- Education
- Walking in another person's shoes for a day
- Subject matter expertise
- Information control
- Demonstrations of success
- Understanding why barriers exist
Overcoming environmental challenges

Be specific

- Provide samples of reports and formats
- Request to sit in the monthly draw meeting
- Request to sit in the weekly schedule review meeting
- Don’t complain but clarify

Be persistent

If the contractor feels they can ignore and bully requests they will do so for the entire project.
Key Risks of This Stage:

- Stakeholder identification
- Architect selection
- Delineation of needs and wants
- Conflicting pragmatic and political objectives
- Note: Architects and engineers are not typically “bid” but are selected based upon their technical qualifications
Example:

A recently constructed medical research facility ($300M) delayed construction so the design team could collaborate with the mechanical, electrical and plumbing professionals. This resulted in:

- 10% reduction in overall construction costs
- Projected operating costs 12% below budget
- Optimum building workflow
- Community buy in and support for the building.
Construction Lifecycle: Contractor Selection & Due Diligence

Key Activities of This Stage:

> Establish technical qualifications (facility’s responsibility)

> Assemble bid package with specifications (facility’s responsibility)

> Request financial package
  - Credit report
  - Credit references
  - Audited or reviewed year end financials
  - Current financials
  - Work in Process (WIP) schedule
  - Backlog schedule
  - List of recent layoffs
Key Activities Continued:

- Indicators of financial weakness
  - Significant changes in owner’s equity
  - Weak cash position
  - Repeated late payments to suppliers
  - Outstanding and recent contractor’s liens
  - Refusal to supply financial information, especially if it is the current financial statement

- Mitigation strategy: Request a performance bond. The bond underwriter will also closely examine the financial strength of the contractor before underwriting the project.

- Caution: Performance bonds don’t mitigate all of the risks! An owner will not be reimbursed for time delays, cost of rework, additional internal efforts, or cost of capital.
Construction Lifecycle: Contractor Selection & Due Diligence

Key Risks of This Stage:

> Selecting a contractor that is unqualified or does not have the financial stability to deliver the project and support its warranty obligations

Example:

A financially weak contractor may result in suppliers and subcontractors not getting paid. The impact to the owner is significant:

- Liens against the building may prevent occupancy
- Construction delays until subcontractors and suppliers are paid
- Reluctance or refusal by professionals to work on the project
- Lost discounts and credits, even late payment penalties
- Impact to the owner’s credit rating
Key Risks:

- Donations and contractor preference
- Unethical bidding practices
- Kickbacks
- Courtesy bids and not competitive bids

Example:

The prime contractor is also a concrete and masonry contractor and intends to bid on this phase of work. The other subcontractors in the market don’t believe that they will have a legitimate chance to win the work and don’t submit their “best” price for the work. The prime’s bid is lowest and they are awarded the concrete work, even though this may not have been the lowest price achievable.
Preconstruction Planning and Due Diligence

Action Items:

> Establish contracting goals and objectives
> Establish development team’s roles and responsibilities
> Determine subcontracting methodology
> Develop contractor qualification criteria
> Establish bidding process
Preconstruction Planning and Due Diligence

Action Items:

- Develop bid award criteria
- Develop owner communication requirements
- Develop project performance reporting requirements
- Develop project cost and financial reporting requirements
- Develop owner’s right to audit requirements
Construction Lifecycle: Contracting

**Key Activities:**
- Determining contract method
- Negotiating contract terms, conditions, and provisions

**Risks:**
- Paying too much for the building
- Restricting the owner’s ability to control financial risk
- Empowering the contractor to legally take advantage of the owner
Key Terms

Competitive Bid

Negotiated

Master Services Agreement
Key Terms

**Contract Types:**
- Lump Sum (Stipulated Sum or Fixed Price)
- Guaranteed Maximum (GMAX or GMP)
- Unit Price
- Time & Material
- Cost Plus Fixed Fee or Cost Plus Percentage Fee
Key Terms

Contracting Methods:
- Competitive Bid
- Negotiated
- Construction Management at Risk
- Construction Management Not at Risk
- Prime Contracting
- Direct Contracting
Key Terms

**Project Delivery Methods:**

- Design – Bid – Build
- Design – Build
- Integrated Project Delivery
Financial Terms:

- Labor Burden Rates
- Overhead Rates
- General Conditions
- Procurement Burden and Mark-Up
- Overbilling
- Aggressive Billing
- Value Engineering
Construction Lifecycle: Contracting – Determining Contract Type

**Lump Sum:**

- Usually less than $10 million
- Facility is fully designed
- Designs are simple and often a duplicate of another facility
- There are fewer unknowns that lead to change orders

**Benefits:**

- Known financial commitment
- Less owner’s administrative burden
- Less risk of scope creep and budget overrun
Guaranteed Maximum Price (GMP)

- Usually used on larger projects
- Project nature is complex with unknowns
- Often coupled with a concurrent design process

**Benefits:**

- Establishes a not-to-exceed price
- Enables the owner to benefit from value added engineering, price reductions, and well managed procurement
- Enables the owner to select and contract with the contractor while still designing the facility
GMP Continued

Disadvantages:

> Requires a more complex contract that specifies as much as possible
> Burdens the owner with more project management and administration
> Project complexity leads to more opportunity for aggressive or abuse behavior
> Contractors like to believe that their budget is the entire maximum price
Cost Plus or Time and Material Contracting

- Usually found in highly complex and very large projects or extremely small maintenance projects
- Unable to determine or estimate the overall project cost
- Projects typically last many years
- Used on projects like nuclear power plants and refineries

Advantages

- Enables an owner to segment a very large project into multiple smaller projects
- Advances the construction timetable so that progress is made on simple phases while engineering continues on more complex phases
Unit Price Contracts:

- Typically used in a utility setting or type of service
- Limited application, used on projects like underground piping and road construction
- These contracts establish a rate price for each type of service to be delivered
- The delivery quantities may or may not be known
- Unit price for each segment of work includes all direct and indirect construction costs

Advantages:

- High degree of control over scope and pricing
- Change orders are easier to calculate
Starting point:

American Institute of Architect (AIA) Contracts

*AIA written to favor the architect and contractor, not the owner and should only be considered a starting point*
Provisions that apply to all contracts:

> Change order process for scoping, pricing, and approval
> Process for handling owner allowances and credits
> Process and pricing for reduction in work scope
> Process for using and reporting contingency budget
> Progress reporting
> Business ethics and professional conduct
> Insurance, guarantee, and warranty requirements
> Right to audit clause
Change order provisions should include the following:

- Definition of major and minor change order
- Authority for approving each type of change order
- Authority for using contingency budget
- Change order documentation
Change order documentation should include:

> Who is performing the work
> Cost breakdown of materials and labor with quantities and rates for each
> Contractor markup
> Clear description of the scope of work
> Clear description of why the change order is necessary
Example

- $6 million renovation project
- Design change necessitated $750,000 of additional electrical work
- Construction contract defined change order approval, contractor billing rates and markup on materials.
- Subsequent change order review uncovered markup had been taken on materials and labor.
- Contractor refunded the owner $46,000.

Provisions that are most applicable to GMP and Cost Plus:

> General conditions fees and definition of what this covers
> Construction management fee and definition of allowable and non-allowable construction costs in the formula
> Self-performed trade and craft costs
> Trade, craft, and professional rate schedules
> Allowable pass through expenses
Costs typically included in General Conditions:

- Job site trailer and utilities
- Winter conditions
- Small tools charge
- Project manager and principal labor charges
- Administrative and overhead costs
- Layout yard and construction material storage
- Value engineering
- Accounting and project reporting
Costs that are not typically included in General Conditions and are the Owner’s responsibility:

- Insurance
- General foremen and supervisory costs
- Pickup trucks and transportation
- Construction material purchasing and transportation
- Computer and office equipment
Provisions that are most applicable to GMP and Cost Plus:

- Established labor and overhead burden rates
- Shared savings calculation
- Self-performed work
  - Bidding
  - Pricing
  - Reporting
Labor Burden:

Labor burden is the incremental cost employers cost to carry an employee on the crew. Typical labor burden costs are:

- Employee benefits
- Employers social security
- Workman’s compensation insurance
- Health and safety
- Federal and state unemployment tax
- Union assessments (pension, training, etc)
Labor Burden should not include:

- Contractor markup or profit margin
- Overhead allowance
- Vehicle allowance
- Tool allowance
- Union dues
Labor Burden risks:

- Overcharging for allowable burden costs
- Charging for non-allowable costs
- Double charging for costs also covered by general conditions
- Double charging for costs that are specific pass through expenses
Shared Savings Calculation

This is an incentive program mutually agreed upon between the owner and contractor to share in savings that arise from:

> Value engineering
> Aggressive purchasing strategies
> Contractor’s supplier relationships

Shared savings risk: Materials that are commodity priced should be excluded from the shared savings calculation.
Self-Performed Work

Trade and craft construction that is performed by the prime contractor. Typical self-performed trades include: site preparation, concrete footings, floors and walls, wall framing, drywall finish, trim and finish.

- Self-performed work should be competitively priced with a separate pricing and scoping document explicitly defining scope, rates, materials and pricing method.
Additional Contract Provisions

Project performance reporting

- Earned value reporting
- Cash requirements forecasts
- Construction schedule
- Budgeted costs to actual
- Estimate to complete forecast

Reporting requirements should include:

- Delivery deadlines
- Content
- Format
Pay Application (Invoice) Documentation

Each month the pay application should be accompanied by:

- Material invoices and receiving tickets
- Time sheets for self-performed work
- Subcontractor invoices
- Equipment logs for contractor provided equipment
- Lien waivers
- Equipment rental invoices
Contractor Payment Terms

Typical terms require the owner to pay the contractor within 30 days of the pay application invoice. Consider the following modifications:

> Payment period begins on the acceptance of a complete pay application, not the pay application date
> Consider owner direct payment for major material purchases
This must be reviewed by your legal counsel prior to implementation:

Right to Audit

Availability of Records. The records of the parties to this Agreement relating to the Project, which shall include but not be limited to accounting records (hard copy, as well as computer readable data if it can be made available; subcontract files (including proposals of successful and unsuccessful bidders, bid recaps, bidding instructions, bidders list, etc); original estimates; estimating work sheets; correspondence; change order files (including documentation covering negotiated settlements); backcharge logs and supporting documentation; general ledger entries detailing cash and trade discounts earned, insurance rebates and dividends; any other supporting evidence deemed necessary by Owner to substantiate charges related to this agreement, and all other agreements, sources of information and matters that may in Owner’s reasonable judgment have any bearing on or pertain to any matters, rights, duties or obligations under or covered by any contract document (all foregoing hereinafter referred to as “Records”) shall be open to inspection and subject to audit and/or reproduction by Owner’s representative and/or agents of Owner. Owner may also conduct verifications such as, but not limited to, counting employees at the job site, witnessing the distribution of payroll, verifying payroll computations, overhead computations, observing vendor and supplier payments, miscellaneous allocations, special charges, verifying information and amounts through interviews and written confirmations with employees, Subcontractors, suppliers, and contractors representatives. All records shall be kept for seven (7) years after Final Completion.
Right to Audit Continued:

*Flow down.*

CM/GC and Architect shall require that all of their payees (including Architect’s Consultants, Subcontractors and Suppliers) comply with the provisions of the Right to Audit article by incorporating these requirements in all written contracts. This requirement to include flow down right to audit provisions in contracts with payees shall also apply to Subcontractors and Sub-Subcontractors, and Suppliers. CM/GC and Architect shall cooperate fully and will request all of their payees to cooperate fully in furnishing or in making Records available to Owner, provided, however, the CM/GC and Architect shall not be responsible for any failure of Architect’s consultants, Subcontractors or Suppliers to comply with recordkeeping requirements after the date of Final Completion.
Designing and implementing project financial controls requires understanding the following:
Where costs originate

Why costs change?
Who can authorize change?
What are leading indicators of change?
Where do construction costs originate?

> Contractor’s budget or Schedule of Values [Pay App 15 March 2012 Payapp.xlsx]
> Contract definition of allowable costs
> Pay applications
> Project change orders
Construction management fee is the agreed upon profit paid to the contractor.

It is usually based on a percentage of the total contractor’s cost of work.

Not the Owner’s cost of the project.
Not the Contractor's cost of the project
Understanding construction costs

Hard costs are usually supported by third party invoices, time sheets, and receiving tickets.

Soft costs are more subject to interpretation and require a thorough analysis to quantify allowable and non-allowable costs.
General conditions is the contractor’s compensation for overhead and indirect project cost

General requirements is the contractor’s soft cost reimbursement
General conditions compensation

Contractor’s compensation methods

- Percentage of cost of work [CMAR and Gen Cond Contract.pdf]
- Lump sum value

Well defined cost and service coverage is key to minimizing disputed general conditions costs
Understanding construction costs

General Conditions.xlsx

Cost category breakdown of general conditions and general requirements
Non-allowable general conditions items

- Project management software
- Software training
- Small tools
- Company owner/principal labor and burden expense
- Site clean up
- Insurance and deductibles
- Bonding
- Executive transportation
- Overtime costs for exempt employees
- Bonuses
- Outside professional services
- Rework resulting from incomplete or unacceptable work product
- Anything with it’s own line item in the budget
Generally accepted general conditions costs:

> Project manager, assistant and superintendent labor costs (project management personnel)
> Vehicle costs for project management personnel
> Job trailer, utilities and job trailer furniture (not to exceed purchase cost)
> Per diems and project management travel costs
Contract provisions and guidelines

> Verify general conditions and requirements do not overlap
> Request rate schedules for all equipment rentals
> Request rate schedules for all vehicle rentals
> Verify what is included in the vehicle rental rate
  – Insurance
  – Depreciation
  – Maintenance
  – Repairs
> Fuel costs are usually excluded from rental rates and stated as a flat daily rate or mileage rate
Construction manager reimbursable costs

Risk analysis red flags

> Excessive vehicle rental rates. Compare with “Bluebook” rates to assess market pricing.
> Mileage reimbursements in excess of IRS guidelines. IRS guidelines include cost of ownership, reimbursement should be less than IRS guidelines.
> Cost of rentals exceeds FMV of equipment purchase
> Absence of usage guidelines
### Breakout session: General conditions

**GENERAL CONDITIONS LISTING**

**GMP PROPOSAL 5/23/2013**

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General conditions – Red flags

Which items on the general conditions expense list require further attention?

> Set up telephone and fax
> Telephone usage
> Copy machine rental
> Copy machine supplies
> Server
> Computer video camera
> Cell phones Cell Phone Analysis.xlsx
> Corporate computers
> FedEx budget
Analyzing lump sum general conditions

Reduce lump sum charges to units of measure that can be benchmarked against market rates

Retail price of commodity goods
> Computers
> Printers
> Copiers
> Cameras

Hours of effort
> Clean up costs
> Hoisting costs
> Security
These are reimbursable administrative costs and other soft costs for the on site construction operation.
### General requirements

**FIELD ENGINEERING**
- Control Survey (Control Points / Lines) $35,840
- Supplies $2,500
**SUBTOTAL** $38,340

**WATCHMAN & JANITORIAL SERVICES**
- Watchman Services $-
- Janitorial (Field Offices) $15,300
**SUBTOTAL** $15,300

**FIELD OFFICES & SHEDS**
- Utilities (by owner) $33,150
- Lunch/Break Area, covered w/ water $15,000
- Mechanical/Electrical Hook-up (Hunt) $5,000
- Pest Control $5,100
**SUBTOTAL** $58,250

**BARRICADES, FENCES & PROTECTION**
- OSHA Requirements $49,500
- Safety supplies and signs $5,100
- Orientation Supplies $5,100
- Construction Fence $14,000
  - Gates - Man/Vehicular in fence $14,000
**SUBTOTAL** $73,700

**TEMP. ROAD, DRAINAGE, ETC.**
- Temporary Crane Roads $14,000
- Lay down Area - gravel lot $10,000
- Dust Control (w site s/c) $-
- Informational/Directional Signs $1,000
- Erosion Control $6,000
**SUBTOTAL** $31,000

**TEMPORARY HEAT**
- Temporary Heat $120,000
- Temporary Cooling $120,000
- Temporary Enclosure $80,000
- Maintenance $12,000
- Remove Temporary Enclosure $22,500
- Ventilation/Circulation Fans $10,250
**SUBTOTAL** $364,750

**CLEANUP**
- Dumpsters $120,690
- During Construction - (composite crew leaders) $437,272
- Final Clean-Up (incl. Glass) $236,021
- Trash Chutes $19,000
**SUBTOTAL** $812,783
## Breakout session: General requirements

### EQUIPMENT RENTAL
- Buck Hoist Communication System: $- 
- Communication Equipment: $12,750 
- Generators: $- 
- Misc. Scaffold: $- 
- Misc. Equipment: $- 
**SUBTOTAL**: $12,750

### ROUGH HARDWARE, SMALL TOOLS
- R-H, Small Tools Other Than Concrete: $20,000 
**SUBTOTAL**: $20,000

### PROGRESS PHOTOS, if req'd
- Aerial Photos and Final photos: $3,600 
- Ground/Interiors: $1,020 
- Final Photos (all bldgs on project): $- 
**SUBTOTAL**: $4,620

### HOISTING
- Hoists: $126,100 
- Initial Install: $- in hoists 
- Install/Remove Gates: $- in hoists 
- Closure at Gates: $- in hoists 
- Dismantle: $- in hoists 
- Maintenance: $- in hoists 
- Tiebacks/Drop Test/Weights/anchors: $- in hoists 
- Dock: $- in hoists 
- Freight In/Out: $- in hoists 
- Operators: $370,240 
- Permanent Elevators (Operated) (2 Pass): $107,668 
- Elevator Maintenance: $23,000 
**SUBTOTAL**: $627,208

### PROJECT SIGN
- Project & Safety sign: $3,000 
**SUBTOTAL**: $3,000

### FIRE PROTECTION & FIRST AID
- Fire Extinguishers: $17,000 
- First Aid & OSHA Supplies: $2,550 
- Safety Incentives: $5,100 
- Drug Testing: $2,295 
- Badging Costs: $1,020 
- Orientation Suppksies: $1,275 
**SUBTOTAL**: $29,240

### TEMP TOILETS
- Temporary Toilets: $38,760 
- Trailer Holding Tanks: $- 
**SUBTOTAL**: $38,760

---

**Note:** The figures are approximate and subject to change based on actual requirements and market rates.
Site clean up case study

Facts:
> $100 million patient tower
> $673,000 site clean up budget
> 51 month construction schedule
> Labor provided by prime contractor
Clean up cost case study

How could a simple clean up budget be a risk area?

- Subcontractors may be responsible for site clean up
- No clean up activities are being performed
- Lump sum budget doesn’t show how many hours of clean up are budgets
Clean up case study

- Day laborer billing rate $20 per hour
- Projected clean up budget 33,650 hours
- 224 weeks of construction
- Average 150 hours per week
- Approx. 4 FTE budgeted for clean up

Remember that many weeks early and late in construction require minimal clean up
General requirement high risk areas

- Communications equipment
- Hoisting
- Signage (often under budgeted)
- Temporary heat

We recommend that general requirements expenses be billed at cost with supporting documentation
General requirements analysis

Gen Requirements Analysis.xlsx
Construction manager direct labor

These are the labor costs incurred by the CM for managing the construction project. The contract or addendums should be very specific to calculating these costs. Provision should include:

- Each staff position with billing rate, field or office designation and exempt status
- Exempt personnel billing may not exceed 40 hours per week
- Overtime must be owner authorized
- Annual increases should be defined and not exceed the local CPI
- Billing rates should be verified with the market to ensure that they are not excessive
- Billing rates should be all inclusive of the labor cost. Labor burden should be defined with a list of each burden component
Price checking labor rates

> Assume a labor burden of 45% [Labor Rate Calculation.xls](#)

> Divide each rate in the labor table by 1.45 to estimate the raw labor rate

> Compare the raw labor rate with published staff rates:
  - McCormick & Dodge
  - Collective bargaining agreements
  - HR surveys
  - CFMA surveys

> Excessive raw labor rates are a red flag that
  - Labor burden may be too high
  - Billing rate may be too high and includes undisclosed profit margin.
Construction manager direct labor

Risk analysis red flags

> Labor rates are too high or too low
> No weekly billable hours cap on exempt employees
> No adjustments for vacation and holiday hours  HolVac Time.pdf
> No estimated staff budgets
> No definition of roles and responsibilities
> Lump sum line item budgets
  – Lump sum project management budget
  – Lump sum burden rates
Construction manager direct labor

Risk mitigating controls

> Verify exempt employees only bill 40 hours per week
> Verify labor rates on monthly pay applications
> Compare direct labor hours billed with schedule progress
> Confirm any overtime billed has been owner authorized
> Document why overtime was necessary and if it will lead to a change order
Construction manager reimbursable costs

Risk mitigating controls

> Reconcile travel costs with days on site
> Verify all billing rates and per diems
> Self-provide equipment instead of renting
  – Computers
  – Job trailer
  – Maintenance equipment
> Reconcile equipment rental charges with FMV
> Reconcile equipment rental with operator time
> Verify fuel surcharges
Usage guidelines

Contract allows for:

> Housing and meals per diem
> Mileage reimbursement
> Travel time to job site

Control challenge

How do you prevent the PM who drives two hours every day to the site from collecting per diem, mileage and travel time?
What are change orders?

Change orders are referred to in a number of ways:

> Change orders
> Change directives
> RFI
> Engineering change notice
> Field change request

All amount to the same thing, an owner’s authorization to change the terms of the prevailing contract
§ 7.3 CONSTRUCTION CHANGE DIRECTIVES

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

Source: AIA 133 Standard Form of Agreement Between Owner and Construction Manager
Change order control is the contractually agreed upon process for scoping, pricing and approving change orders.

Change Order Guidelines

> Quote Method: Time and materials not to exceed
> Format: Scope, cost, quantities and mark up
> Timeliness
> Usage
> Authorization
> Prohibit compounding of change orders
§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

1. Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
2. Unit prices stated in the Contract Documents or subsequently agreed upon;
3. Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
4. As provided in Section 7.3.7.

Source: AIA 133 Standard Form of Agreement Between Owner and Construction Manager
Why do change orders occur?

> Owner initiated change to the project
> Contingency expenditure
> Change in construction conditions
> Change in specifications
> Change in building code
> Change in market conditions
Due to completion of construction documents, changes in building code or refined materials specifications additional labor and materials are required to deliver the scope of work

Resulting from:

> Bids based on incomplete construction documents
> Regulatory design review demands design changes
> Equipment specified is modified or changed
The cost of procuring construction services, supplies and equipment are materially different than the estimated costs

Resulting from:
> Dramatic material shortages
> Labor shortages
> Commodity price speculation
Construction conditions are not what was expected or reported to the contractors

May include:

> Unusually inclement or adverse weather
> Unreported soil conditions
> Environmental hazards
Owner initiated change orders

Represent new or additional work not planned for in the estimated scope

May result in:
> Increase to the GMP
> Change to the construction schedule
> Use of contractor’s contingency budget
> Use of owner’s contingency budget
> Reduction to another part of the project budget
Change order audit risks

Audit risk categories

> Unauthorized change orders
> Unnecessary change orders
> Redundant or duplicate change orders
> Overpriced change orders
Unauthorized change orders

Work that is performed and charged for without having been authorized by the owner

Why does this happen?

> Miscommunication
> Procrastination
> Budget overruns
> Schedule delays
> Rework
> Warranty work
> Quality issues
Unnecessary change orders

Change orders that have been properly approved but deliver no apparent value to the project

Resulting from
> Existing scope
> Unnecessary add on
> Rework
Overpriced change orders

Change orders that have been approved but are overpriced for the scope of work proposed

Overpricing comes from:
> Inflated labor rates
> Inflated hours
> Exaggerated profit margins
> Compounded fee computation (fee on fee)
Change order control

Risk assessment red flags

> Lump sum change orders
> Contractor’s contingency usage
> Push back based on:
  – It’s easier for the contractor
  – It takes too much time
  – We can true that up later
> Premium pricing or higher mark ups
Risk mitigating controls

> Verify approval and timeliness
> Verify change order scope with contract
> Verify change order pricing with contract
> Document the purpose of the change order
  – Owner directed change
  – Code compliance
  – Design omission
  – Change in conditions

Subcontractor Change Order Pricing Form Example.xls
Change order red flags

- No rejected change orders
- Project end change orders
- Significant value engineering adjustments
- Changing contractors during construction
- Too few change orders
- Material substitutions
- No contractor’s contingency reconciliation

> No negotiated change orders
> Remodeling projects
> Too few change orders
> Change order value greater than 10% of original budget
> Bids prepared at less than 100% of construction documents
> Remodeling projects
Contingency budgets and allowances

> Contractors contingency: Contractor’s budget for in scope budget changes

> Owner’s contingency: Owner’s budget for out of scope changes

> Allowances: Segregated construction budget dedicated for a specific use that may not have a budget and contract or GMP time.
Change order schedule checklist

> Verify all change orders are authorized
  – Look for rejected items being resubmitted

> Decompose consolidated change orders into individual line items

> Look for duplicate change orders
  – Same value at with different dates
  – Same documentation used individually and consolidated

> Verify all computations

> Look for old line items
Change order pricing

Case Study Facts
Scope: Add outlets, lights, dimmers per owners request

<table>
<thead>
<tr>
<th>Electrical contractor’s invoice</th>
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<tr>
<td>Labor cost: 280 hours @ $95</td>
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<tr>
<td>Material cost: Outlets, switches, lights. Supported with supplier invoices</td>
</tr>
<tr>
<td>Subtotal</td>
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<tr>
<td>Overhead and profit 10% (per contract terms)</td>
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<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Analysis:
> Materials were passed through at cost
> Overhead and profit were at contract terms
> Labor was at contracted rate
> Owner was overcharged $2,660 or 6% of the change order value

Why? Labor rate already included overhead and profit
Change order pricing audit checklist

> Request detail backup for lump sum change orders
> Verify labor rates with base contract
> Verify hours are appropriate for scope of work
> Verify quantities are appropriate for scope of work
> OCIP projects make sure to discount labor rates for owner paid workers compensation insurance
> Negative change orders should include a CM fee credit
> Verify that general conditions changed before accepting a GC fee adjustment

Resources

> TRA-SER
> Equipment Watch
> Composite crew rate analysis
> RS Means
> Labor burden analysis
Know what is allowed in the contract!!

> Examine the change order scope for the source of the change
> If you can’t discover the source from the documentation ask the subcontractor for an explanation.
> Examples of typical non-allowable change orders
  – Rework for quality [CO Control Schedule.docx](#)
  – Rework for plan and specification compliance
  – It is already in the plans and specifications
  – It should have been in the plans and specifications. An owner has a realistic expectation that the construction drawings will satisfy local and state building code. Design oversight may result in the architect compensating the contractor for rework
Contractor’s contingency

Case study facts:

> Original lump sum contract value: $6,000,000 with a $50,000 contractor’s contingency budget

> Change orders reviewed and approved of $750,000 increasing the contract value to $6,750,00

> Contract requires the owner to approve any use of the contingency budget

Analysis:

> Review of the change order log shows no documented use of contingency budget

> Contractor billed through 100% of the change orders with 9% for CM and GC fees

> The final application was adjusted for the contingency and the owner was credited $54,500
Facts:

> Electrical subcontractor has change order terms allowing 10% markup on cost, including materials, equipment and labor
> Original contract had been $5,500,000 GMP then converted to lump sum with no conversion incentive
> Lump sum contract of $5,500,000, 94,372 man hours, average cost $58.28 per hour, including profit
> Labor burden contracted at 65%
> Change order pricing based on composite rate of $58.28 plus 10%
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<th>Labor Rate</th>
<th>Burden Rate</th>
<th>Total Hourly Wage</th>
<th>Quantity</th>
<th>Hours</th>
<th>Daily Wage</th>
<th>Fully Loaded Composite Rate</th>
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What is wrong with this change order?

- Billing rate was based on an average billing rate and not weighted average
- Billing rate already included the 10% markup
- Labor rate was overstated by $11.35 per hour
Actual results upon findings presentation

No credits were issued to the owner for the following reasons:

> Final lien waiver had already been issued
> Owner and prime contractor had 30 months and over 60 electrical change orders to raise this issue
> Owner and prime contractor had signed off on the change orders
> Retainage had already been paid to subcontractors
> Corp Counsel agreed that the Owner had no recourse since the final lien waiver had been accepted by all parties
Lessons learned by the Owner

Closeout auditing is less effective than continuous monitoring
Sampling lump sum change orders during the course of construction never revealed the inflated billing rate
Prime contractors don’t usually understand subcontractor billing rate structures.

> No one questioned that the average raw labor rate was $2.00 per hour higher than the journeyman rate

> No one saw that similar scoped change orders had different prices

The Owner forfeited more than $113,000 in potential project credits
Change orders –
GMP contract lump sum presentation

Facts:
> GMP contract
> Change orders with no detail or back up
> No cooperation from the contractor

What can you do?
1. Determine if your organization will do anything with pricing discrepancy information
2. Meet with the architect and review the construction bulletin for the large change orders
3. Contact the subcontractors for job cost, change order and billing information
4. Build a baseline c/o price using third party estimating resources
5. Consult with an estimating SME to examine the construction bulletins and develop a baseline C/O price
6. This is a cost based contract and the owner is entitled to request the contractor’s change order cost information. A letter from Corporate Counsel to the prime may remind them of this obligation.
Expectations Management

Compliance Oriented Audit

- Variance from policies and procedures
- Major budget deviations
- Major schedule deviations
- Limited financial analytics
- Unplanned construction cost recovery

Project Controls Oriented Audit

- Everything in a compliance oriented audit plus
- Detailed financial analytics
- KPI variance analysis
- Variance investigation
- Anticipated construction cost recovery
Audit program

> Preparation of control schedules
> Reconcile project expenditures
> Direct labor analysis
> Labor burden analysis
> Change order analysis and pricing analysis
> Subcontract analysis
> Material purchases
> Verification of contracted scope
> Equipment rental analysis
> Bonds and insurance analysis
> Quality assurance and quality control
Key risks

> Overcharging for labor and materials
> Over priced change orders
> Charges for re-work
> Lost incentives and credits
> Failure to deliver contracted scope
> Charges for non-allowable costs
Construction audit program development

Construction audit program fundamentals

> Document and analyze construction process controls
> Test financial controls for weakness and/or compliance
> Reconcile contractor’s cost calculations
> Verify contractor’s cost calculations with contract terms
> Recommend financial control improvements
> Validate continued testing with cost/benefit analysis
> Tailor test programs to focus efforts on highest and most exposed construction financial risks
Preparation of control schedules

> Contractor’s applications for payment
> Owner’s project payments
> Pay application back up documentation
> Contractor’s costs by major construction phase
> RFIs and scope changes
Reconciliation of project expenditures

> Obtain all project related financial or accounting transactions that document owner expenditures
> Reconcile the sum of the total payments made to each vendor to the various contract amounts as adjusted by change orders
> Review itemized payments made to each vendor for each project and vouch a sample of vendor payments to canceled checks other support
> Review a sample of invoices paid direct by the owner for services, materials or other costs which may have been the responsibility of the general contractor
Construction audit program

Direct labor analysis

> Obtain payroll registers and certified payroll information
> Audit for activity which may not be legitimate reimbursable costs
> Compare independent records of activity at the job site to the payroll charges
> Determine whether or not personnel charged to the job may have been working for subcontractors or affiliates without appropriate back charges
> Trace payroll charges to the contractor’s payroll register
> Reconcile payroll registers
> Verify allocation of payroll costs
Labor burden analysis

> Decompose the labor burden and determine the basis for the contractor's charges for payroll taxes, insurance, and fringe Audit for activity which may not be legitimate reimbursable costs

> Determine that the contractor's charges for FICA, FUTA, WC, and SUTA are appropriate

> Review other components of contractor's labor burden charges for appropriate methodology in application Trace payroll charges to the contractor’s payroll register

> Decompose the union benefits charges and separate from labor burden charges
Change order audit program planning:

> Documentation and control
> Authorization
> Price analysis
> Scope analysis
> Control schedules
Change order analysis

> Prepare a control schedule of owner change orders
> Review the detailed change order backup documentation
> Perform recalculation of change orders
> Verify labor and labor burden pricing for change orders
> Verify appropriateness of change order material pricing, material quantity take-offs, labor productivity factors, and related extensions
> Review change order for errors
Construction audit program

Change order pricing analysis

> Ensure the change order represents a legitimate change in scope
> Review for possible deletions or partial deletions or changes in scope
> Determine whether or not any owner provided items might have been used
> Review for proper application of sales taxes
> Verify that contractor does not participate in inflated change order price proposals
Subcontracts

> Prepare a control schedule of all base subcontract and subcontract change orders
> Review all change orders issued to subcontractors
> Balance paid invoices to the schedule of base subcontract and change orders
> Verify credit invoices or un-invoiced amounts which may indicate a substitution, credit alternate, backcharge, etc.
> Reconcile back charges with subcontractor credits
> Confirm receipt of unconditional lien waivers
Material purchases

> Examine contractor's job cost detail
> Review competitive quotes obtained from material suppliers
> Review invoices and related material delivery tickets for job description, delivery address, authorized invoice approvals, appropriate acknowledgement of receipt for use at the site, etc.
> Audit for indications of material being returned for credit
> Audit for purchases of excessive amounts of material
> Compare the as-built quantity take-off to the actual quantities purchased and billed to the project
> Examine test and inspection reports
Bonds and insurance analysis

> Obtain copy of contractor's Performance and Payment Bonds and corresponding power of attorney from surety
> Confirm bond coverage directly
> Verify underwriter rating meets contractual minimum standards for financial stability in the event of a claim against the bonds
> Review the contract to determine the type and amount of general liability and other special insurance coverage required to be carried by the contractor
> Obtain copies of Insurance Certificates from contractor
Verifications of a contractor’s scope of work

> Develop a list of unusual scope of work items to be independently verified
> Recalculate contractor incentive bonus computations
> Reconcile use of contingency budget with status reports and documentation
> Reconcile accepted alternatives with change orders and adjustments
> Verify unaccepted alternatives are not substituted
> Reconcile allowances with contractor delivered work
Construction audit program

Quality assurance and quality control

> Review minutes from various meetings, contractor's daily logs, engineering field test reports and any other correspondence files
> Obtain and review the contract with materials testing and quality control/quality assurance firms
> Obtain and review contractor and/or subcontractor submittals, shop drawings and cut sheets
Equipment rental analysis

> Obtain a breakdown of the contractor’s equipment rental rates charged to the project
> Test to determine whether the equipment rates were billed properly
> Obtain daily reports and/or time sheets which document the equipment usage
> Review miscellaneous purchases charged to the job
> Ensure that the rates charged are consistent with those prevailing in the local area
Risks that arise during project closeout

- Owner allowances disappear
- Excess supplies are not properly credited
- Shared savings calculations are erroneous
- Final lien waivers are missing
- Contractor billings exceed contractor’s costs
Risks that arise during project closeout

Final project management tasks are forgotten

> As-built drawings are not delivered
> Equipment warranty documentation and operating manuals are lost
> Project documentation is not completed
Discussion topic

Which of these projects carry the greatest construction risk?

A. Operating room remodel
B. CEO office remodel
C. New research library
D. First major capital project in 30 years
Selecting a construction project for closeout or post construction auditing

P.R.E.T.T.Y. attributes should be considered when evaluating projects for audit

P – Perceived project satisfaction
R – Record keeping
E – Enterprise risk
T – Timing
T – Total construction budget
Y – Your ability to act upon audit findings
Pros and cons of continuous monitoring

Pros

> Early detection of non-compliance items
> Prevention of abusive behaviors
> Minimize the “I forgot” and lost document syndrome
> Higher return on investment
  – Typically three percent or more of the construction costs
Cons

- Can require more time of internal audit professionals
- Difficult to document and calculate the value of prevention
- Requires greater subject matter knowledge
Pros and cons of post-construction audits

Pros

> Easier to quantify the value of the audit
> Requires fewer resources
> Easier to identify policy and procedure variances
Pros and cons of post-construction audits (cont.)

Cons

> Greater risk of memory and document loss
> Forfeit the opportunity to prevent something from occurring
> Higher probability of contractor conflict while negotiating issue resolution
How to budget and pay for the construction audit

Rules of thumb to follow

Audit hours equal 0.001\% times the construction cost.

> For instance, a $50 million project should have 500 audit hours
> This assumes an experienced team, moderate construction schedule and an average building
Rules of thumb to follow (cont.)

The cost of the construction audit is a real construction cost like project management, engineering services and construction materials.

Options to pay for the construction audit:
> Capitalize the cost with other construction costs
> Charge back to facilities management
> Special budget resource request to fund the
> construction audit as a special project
> Part of annual internal audit budget
Closeout construction audit expectations

Rules of thumb to follow

Closeout audits typically yield findings in excess of 1% of the construction budget

> For instance, a $50 million project should identify $500,000 or more in findings

> Negotiating settlement will return thousands of dollars back to the institution

> This assumes a well-managed project with good project controls. The findings can be even higher on a poorly managed project.
Construction Fraud Discussion
Fraud – by definition

> Deceit, trickery, sharp practice, or breach of confidence, perpetrated for profit or to gain some unfair or dishonest advantage

> A particular instance of deceit or trickery (e.g., mail fraud, election fraud)

> A person who makes deceitful pretenses; sham; poseur

Fraud – broad legal definition

> There must be a deliberate misrepresentation of the product’s condition and actual monetary damages must occur
## Types of Fraud Related to Construction

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Statistics</th>
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| Billing Schemes           | Any fraud scheme in which a person causes his or her employer to issue an irregular payment for goods or services | Median Loss: $128,000  
Median Duration: 24 Months |
| Non-Cash Misappropriations| Any scheme in which an employee steals or misuses a non-cash asset           | Median Loss: $90,000  
Median Duration: 15 Months |
| Corruption                | Employee’s use of his or her influence in business transactions for the purpose of obtaining a benefit for him or herself or someone else | Median Loss: $375,000  
Median Duration: 18 Months |
| Payroll                   | Any scheme in which an employee causes an irregular compensation payment     | Median Loss: $72,000  
Median Duration: 24 Months |

Report to the Nations, Association of Certified Fraud Examiners, 2010
Fraud Case Studies

Report to the Nations, Association of Certified Fraud Examiners, 2010
Fraud Case Study: Repairs and Maintenance

Facts

> Annual repair budget $30 million
> Repair work is sole sourced to a large local contractor who is a major donor to the institution
> Work orders with budgets are issued for each repair project
> The price for the work is competitive and consistent with other construction estimates
> Supporting documents for invoices are verified and appear to be in good order
Where was the owner defrauded on this work?

> Repairs were made by salvaging materials from the repair site and reusing them to make the repairs

> Materials and supplies that were purchased for the repair work and billed to the owner were stockpiled into the contractor’s inventory
How was this detected?

> Baker Tilly worked with Facilities to inspect the completed work and identified window casings that were nicked and cracked

> Our follow up review of the waste removal invoices uncovered too little waste had been sent to the landfill

> Our subsequent interviews with construction crews discovered they had been instructed to salvage and reuse as much material as possible
What was the estimated cost of this scheme?

Over a three year period, the Owner had been defrauded by over $1,000,000.
Methods

> Billing equipment or personnel at rates that are higher than agreed upon rate tables
> Miscalculating rate increases
> Pay application or invoice arithmetic errors
> Billing for costs not associated with the project
Facts

> Trusted contractor with over 20 years invested in the relationship
> Major contributor to the institution’s charitable foundation
> Trusted personal friend of the President and Chairman of the Board
> New Facilities Director coming on board asks for a construction audit as due diligence effort
Fraud Case Study: Billing

Where was the Owner defrauded?

> The lobby and fireplace that had been donated by the contractor for the building had been billed to the Owner

Additionally, what did the construction audit find?

> Construction contracts were poorly written and very one sided

> The Owner had agreed to pay a two percent warranty fee when industry practice is there is no charge for warranty work
How did these findings change business practices?

- New construction contract templates were written based on well controlled contracting practices
- The contractor has been banned from future work at the institution
- Gift and entertainment policies were changed to prevent employees and officers from accepting high value gifts
- Owner refused to accept the terms of the financial settlement
- Owner shares this story with peers at association meetings
Fraud Case Study: Billing

Facts

> Owner has an annual construction budget in excess of $100 million
> Master services agreements have been negotiated with several contractors to help ensure competitive pricing and reliable resources
> Internal audit performs a limited construction audit of the projects on a annual basis
> Audit reports never revealed any significant findings
> Project is on time and on budget; correct arithmetic on invoices and change orders followed policy and procedure
Where was the Owner defrauded?

> Equipment was billed as higher rates than were agreed to in the master services agreement
> The billing rates used were newly negotiated with an effective date in the future from the date of work
> Invoices were billed late to imply the work dates coincided with contract effective dates
> Invoices were intentionally mislabeled with the wrong contract code linking the invoice to contracts with higher billing rates
Fraud Case Study: Billing

How was this detected?

An observant project manager noticed that one invoice had different billing rates for the same piece of equipment, which was also used during the same time period and at the same location and became curious.

Baker Tilly then worked with the institution to perform a full construction audit. We tested 100% of the billed transactions from a particular vendor and helped to identify items for a multi-million dollar settlement.
Material Fraud

Methods

- Material substitution
- Incorrect material measurements
- Failure to credit for unused materials and supplies
- Failure to credit for Owner direct purchases
- Installation of substandard materials
Fraud Case Study: Materials

Facts

> Owner contracted to build a $12 million parking structure
> Significant excavating and site preparation was required due to site conditions
> Site preparation budget was over run by 100%
> Poor ground quality required many extra trucks of gravel
> Unusual amounts of rain compounded the site condition problems and delayed the construction schedule
Case Study: Material Fraud

Where was the Owner defrauded?

- This resulted in a higher price per ton of gravel than the trucking tickets represented
  - Gravel is typically sold by the ton
  - The unusual weather had significantly raised the moisture content in the gravel increasing the weight of a cubic yard of gravel
Case Study: Material Fraud

How was this discovered?

- Internal audit was performing an interim audit of the project and noticed the major site preparation budget overrun.
- After Internal Audit and Baker Tilly interviewed the project manager, the auditor learned that the project had been affected by the recent rains, which explained the overrun. This prompted the auditor to ask the project manager, why does rain cost a project so much money?
- The project manager went on to explain all of the tasks impacted by rain.
- During the course of this discussion, they realized that the aggregate they had been purchasing hadn’t been price adjusted for moisture content.
Discussion topic

Which of these is corruption?

A. In return for awarding the work, the contractor gives the Owner’s son a job on the construction crew.

B. To facilitate a building inspection, the contractor provides the inspector transportation and a box lunch to a remote construction site.

C. The Owner has lunch brought to the site for the construction crew to celebrate reaching a major project milestone.

D. All of the above.
Fraud Case Study: Corruption

Facts

> Owner uses competitive bidding to procure contractors
> Bids are submitted sealed and opened under strict observation and recording procedures
> Bids are closely grouped and prices reflect historical experience
> Project is awarded to low bidder
> The owner has a great experience with the contractor and is happy to give the contractor a reference
How was the Owner defrauded?

The winning contractor had been bribing project managers at two of their closest competitors to share confidential bid information enabling the contractor to prepare and submit the lowest bid.

Let’s consider the ethics of how an Owner operates.
Fraud Case Study: Corruption

How was this detected?

> During the annual process of approving contractors for the next year a project manager noticed one contractor had been awarded an unusually high number of bids

> This prompted Internal Audit and Facilities, working with Baker Tilly, to analyze the bid tabulations from each project awarded the last twelve months

> The analysis found too many close bids, which lead to a deeper investigation and ultimate discovery of information leaks
Questions?

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Additional resources

> [www.bakertilly.com/construction-audit-webinar](http://www.bakertilly.com/construction-audit-webinar)
> [https://www.thenaca.org/](https://www.thenaca.org/)
> [http://www.csinet.org](http://www.csinet.org)
Required firm disclosure and Circular 230
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